Claims

[c1]   1.A gradient coil assembly for a magnetic resonance imaging system comprising:

at least two coils, the coils comprising:

at least one conductor mechanically bonded via a non-conducting substrate; and

wherein a bonding surface of the at least one conductor has been subjected to a surface treatment to improve the mechanical bonding properties of the bonding surface.

[c2]   2.The gradient coil assembly of claim 1, wherein the surface treatment provides a surface of microscopic dendritic structures to the bonding surface of the at least one conductor.

[c3]   3.The gradient coil assembly of claim 1, wherein the surface treatment provides a black oxide coating on the bonding surface of the at least one conductor.

[c4]   4.The gradient coil assembly of claim 1, wherein the surface treatment provides a red oxide coating on the bonding surface of the at least one conductor.

[c5]   5.The gradient coil assembly of claim 1, wherein the surface treatment provides a brown oxide coating on the

bonding surface of the at least one conductor.

[c6]   6.The gradient coil assembly of claim 1, wherein the at least one conductor is a copper conductor.

[c7]   7.The gradient coil assembly of claim 1, wherein the at least one conductor is a saddle coil.

[c8]   8.The gradient coil assembly of claim 1, wherein the at least one conductor is mechanically bonded to at least one coil.

[c9]   9.A magnetic imaging system comprising:
a system controller;
a gradient amplifier unit in operable communication with the system controller;
a magnetic assembly in operable communication with the gradient amplifier, the magnetic assembly comprising:
a gradient coil assembly comprising at least two coils, the coils comprising:
at least one conductor mechanically bonded via a non-conducting substrate; and
wherein a bonding surface of the at least one conductor has been subjected to a surface treatment to improve the mechanical bonding properties of the bonding surface.

[c10]   10.The magnetic imaging system of claim 9, wherein the

surface treatment provides a surface of microscopic dendritic structures to the bonding surface of the at least one conductor.

[c11]   11. The magnetic imaging system of claim 9, wherein the surface treatment provides a black oxide coating on the bonding surface of the at least one conductor.

[c12]   12. The magnetic imaging system of claim 9, wherein the surface treatment provides a red oxide coating on the bonding surface of the at least one conductor.

[c13]   13. The magnetic imaging system of claim 9, wherein the surface treatment provides a brown oxide coating on the bonding surface of the at least one conductor.

[c14]   14. The magnetic imaging system of claim 9, wherein the at least one conductor is a copper conductor.

[c15]   15. The magnetic imaging system of claim 9, wherein the at least one conductor is a saddle coil.

[c16]   16. The magnetic imaging system of claim 9, wherein the at least one conductor is mechanically bonded to at least one coil.

[c17]   17. A method for assembling a gradient coil assembly, the method comprising:
treating a bonding surface of at least one conductor; and

bonding the at least one conductor to a nonconducting substrate.

[c18]   18. The method for assembling a gradient coil assembly of claim 17, wherein the treating of a bonding surface provides a surface of microscopic dendritic structures to the bonding surface of the at least one conductor.

[c19]   19. The method for assembling a gradient coil assembly of claim 17, wherein the treating of a bonding surface provides a black oxide coating on the bonding surface of the at least one conductor.

[c20]   20. The method for assembling a gradient coil assembly of claim 17, wherein the treating of a bonding surface provides a red oxide coating on the bonding surface of the at least one conductor.

[c21]   21. The method for assembling a gradient coil assembly of claim 17, wherein the treating of a bonding surface provides a brown oxide coating on the bonding surface of the at least one conductor.